OPERATOR'S MANUAL TX200

INCLUDES OPERATION, MAINTENANCE AND TROUBLESHOOTING GUIDES

LAST MODIFIED 24/02/2014
v1.12a

VIPER TX200

VARIABLE PRESSURE FAST FILL TEST RIG

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATING, ADJUSTING OR SERVICING THIS EQUIPMENT

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

Viper TX System Data

Max. Air Inlet Pressure	150 psi (10.3 bar)
Max. Test Pressure	1350 psi (93.1 bar)
System Dimensions	840 x 840 x 1600 mm 33 x 33 x 63 inches
System Weight (Dry)	265 lbs (120 kgs)
System Weight (Wet)	715 lbs (325 kgs)
Max. Suction Lift	10' (3.05 metres)
Storage Capacity	45 gallons (205 litres)

Piston Pump Data

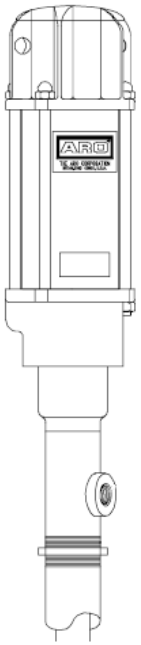
Pump Model	650409-X series
Pump Type	2-Ball Piston Pump, 9:1 ratio
Pump Materials	Aluminium / Stainless Steel.
Max. Air Inlet Pressure	150 psi (10.3 bar)
Fluid Pressure Range	0 - 1350 psi (0 - 93.1 bar)
Max. Outlet Pressure	1350 psi (93.1 bar)
Max. Flow Rate	2.5 gpm (10.8 lpm)
Displacement / Cycle	0.04 gallon (0.18 litres)
Max. Cycles / Minute	60
Max. Temp. Limits	35º - 150º F (2º - 66º C)
Pump Dimensions	1401 x 159 x 133 mm 55¼ x 6¼ x 5¼ inches
Noise Level @ 60 psi	80.0 db(A) * +

* The pump sound pressure levels published here have been updated to an Equivalent Continuous Sound Level (L_{aeq}) to meet the intent of ANSI S1.13-1971, CAGI-PNEUROPS5.1 using four microphone locations.
+ Tested with 91790 Muffler installed.

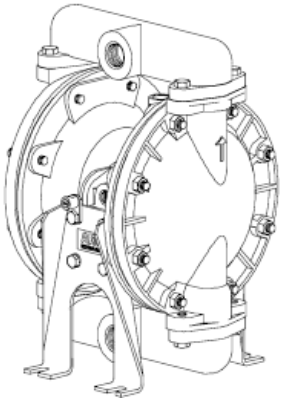
Diaphragm Pump Data

Pump Model	666120-XXX series
Pump Type	Diaphragm Pump, 1:1 ratio
Pump Materials	Aluminium
Max. Air Inlet Pressure	120 psi (8.3 bar)
Fluid Pressure Range	20 - 120 psi (1 - 8.3 bar)
Max. Outlet Pressure	120 psi (8.3 bar)
Max. Flow Rate	30 gpm (133 lpm)
Displacement / Cycle	0.13 gallon (0.6 litres)
Max. Particle Size	⅛" dia. (3.2 mm)
Max. Temp. Limits	35º - 150º F (2º - 66º C)
Pump Dimensions	318 x 216 x 203 mm 12½ x 8½ x 8 inches
Noise Level @ 60 psi	64.5 db(A) *

* The pump sound pressure levels published here have been updated to an Equivalent Continuous Sound Level (L_{aeq}) to meet the intent of ANSI S1.13-1971, CAGI-PNEUROPS5.1 using four microphone locations.



Piston Pump
Model: 65040X-X



Diaphragm Pump
Model: 66612X-XXX

General Description

The Viper TX200 unit is a variable pressure, fast fill test rig system offering fast and efficient integrity and pressure testing of all vessels, hoses, pipelines and systems using ATEX Approved high pressure pumping systems.
As authorised distributors of ARO/Ingersoll-Rand, Air Pumping utilise one ARO double diaphragm pump and one ARO high pressure piston pump per Viper TX unit. This pump combination allows for rapid pressurisation of the test subject, combined with extreme high pressures, saving you time, money, and energy.
The Viper TX system can be used to pressure test any hoses, piping, and in fact nearly any pressurised liquid handling system. The system features an automatic cut out at pre-selected pressures, variable test pressure up to 1350 psi, is easily manoeuvrable even when full, and with all parts intrinsically safe, can be used in even the most hazardous of environments.

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HEALTH & SAFETY PRECAUTIONS

PLEASE READ AND FOLLOW THIS INFORMATION TO AVOID PERSONAL INJURY AND PROPERTY DAMAGE

WARNING!

DO NOT operate the system above recommended air pressure of 150 psi (10.3 bar) or 75 cycles per minute.

Excessive Air Pressure can cause personal injury, pump damage or property damage.

Be sure material hoses and other components are able to withstand fluid pressures developed by this pump.

Check all hoses for damage or wear.

Be certain dispensing device is clean and in proper working condition.

WARNING!

Hazardous Pressure can result in serious injury or property damage.

DO NOT service or clean pumps, hoses or dispensing valve while the system is pressurised.

Disconnect air supply line and relieve pressure from the system by opening dispensing valve or device and/or carefully and slowly loosening and removing outlet hose or piping from pump.

Disconnect air line from the system when idle for long periods of time.

WARNING!

Excessive air pressure can cause pump damage, personal injury or property damage

A Filter capable of filtering out particles larger than 50 microns should be used on the air supply.

There is no lubrication required, although if lubricated air *is* present, make sure that it is compatible with the Nitrile "O" rings in the air motor section of the pump.

WARNING!

Hazardous Materials can cause serious injury or property damage.

DO NOT attempt to return a pump to the factory or service centre that contains hazardous material. Safe handling practises must comply with local and national laws and safety code requirements.

CAUTION!

Verify the chemical compatibility of the pumps wetted parts and the substance being pumped, flushed or re-circulated. Chemical compatibility may change with temperature and concentration of the chemicals within the substances being pumped.

CAUTION!

Maximum temperatures are based on mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperature.

CAUTION!

Be certain all operators of this equipment have been trained for safe working practices and understand the systems limitations.

Prevent unnecessary damage to the pumps.

DO NOT allow pumps to operate when out of material for long periods of time.

Use only specified replacement parts to assure compatible pressure rating and longest service life.

WARNING! **Hazards or unsafe practises which could result in severe personal injury, death or substantial property damage**

CAUTION! **Hazards or unsafe practises which could result in minor personal injury, product or property damage**

OPERATING INSTRUCTIONS

PLEASE READ AND FOLLOW THESE STEPS TO ENSURE CORRECT SYSTEM OPERATION

1. Ensure there is a small amount of oil in the solvent cup (5) of the black 9:1 ratio pump (A) in the centre of the drum.
2. Connect a water supply to the unit using the ½" hose tail connection (D) located to the side of the drum. The water level will now be maintained by the internal ball-cock.
3. Connect an air supply to the air filter / regulator (E) situated by the unit's handle.
4. Check that the ¼" High Pressure Bleed-Off Valve (7) and the three ½" ball valves (1, 2 and J) on the air supply manifold are closed.
5. Set air filer / regulator (E) to approx. 90-100 psi, then set the test regulator (G) to desired pressure. See below for test rates.
6. Connect the hose assembly (Point C) to be tested, making sure the 1" ball valve is open.
7. Turn on the air supply (2) to the fast-fill double-diaphragm pump (B) until it audibly slows down. Turn off the air to this pump (2 / B) and open the ¼" bleed valve (7) situated on the manifold. This allows pressure in the hose section to drop, and at the same time eliminate any trapped air caught up.
8. Repeat the above operation two / three times until the double-diaphragm pump (B) slows down and eventually stalls, indicating the hose to test is full of water.
9. Turn off air to double-diaphragm pump (2).
10. Turn on air supply (1) to larger 9:1 ratio pump (A), noting test pressure reading from the large oil-filled gauge at front of the unit (C). If the pressure is too high or too low, adjust the air feed pressure (1) to the larger pump (A) until optimum pressure is reached.
11. The pressure displayed on the gauge (C) should hold steady, if the pressure begins to drop, inspect the hoses for any leaks, nicks or kinks.
12. When the hose pressure has held for a suitable period of time (dependant on your testing procedures), open the ¼" bleed valve (7) and then the 1" ball valve (6) to allow the hose pressure to vent back into the water storage tank.
13. Close 1" ball valve (6) and disconnect the hose section. The hose has been tested.
14. If you have any further hoses or hose systems to test, please follow these points again from step 6.

Please Note: When testing either hoses or complex mechanical systems, it is important to be sure that NO air is trapped within the system(s) or hose(s). When the system on test is completely full of water, the double-diaphragm pump will audibly slow down and stop very quickly. If air IS present in the system, you will hear the diaphragm pump stroking slowly as the trapped air is compressed within the system, and this will continue stroking until the system is vented.
Although it is possible to achieve the required testing pressures with the latter method, the pressures it offers are unreliable compared to that of testing with water alone, this is down to fluids compressing quicker than the gases.

REFERENCE FO TEST PRESSURE LEVEL

PLEASE READ AND UNDERSTAND BEFORE PRESSURISING THE SYSTEM.

When testing hoses or systems, it is important to achieve the correct air inlet pressure due to the use of the 9:1 ratio high pressure pump (A). This pump allows for high pressure testing on the hose side, but it must be taken in to consideration that this is an *achieved* output, pressurised by the 9:1 ratio piston pump.

For example: to test a pipe at a pressure of 1000 psi (C), the inlet pressure (E) must be approx 111 psi.

This is worked by taking the required hose test pressure and dividing by a factor of 9, so the systems *inlet* (E) pressure must be one ninth of the pressure we wish to test the hose at.

See conversion table opposite for a basic guide.

Test Pressure	Inlet Pressure
100	11
300	33
600	66
900	99
1000	111
1100	122
1200	133
1300	144
1350	150

TROUBLESHOOTING

Piston Pump (A) will not cycle
- No pressure to the motor
- Restricted air lines
- Damaged motor

Pressure builds on one stroke only
- The lower check may not be seating in the foot valve. Remove the check from the foot valve, clean and inspect the valve seat area.
- Middle packings maybe worn. Replace as necessary.

Material leakage from solvent cup
- Tighten the solvent cup. If leakage continues, check upper packings for wear.

Excess air in test circuit
- Check connections of plumbing
- Check "O" rings between manifold and fluid caps of diaphragm pump (B)
- Check tightness of diaphragm nut (B)

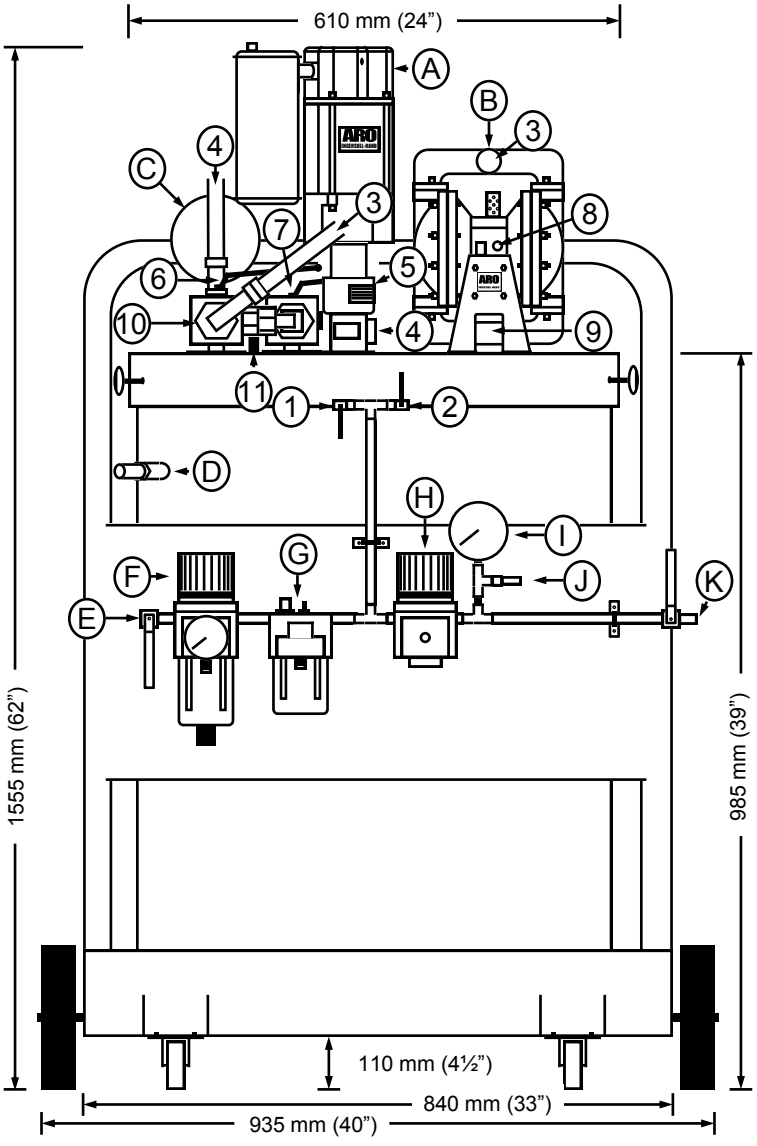
Low fill time, erratic flow or no flow
- Check air supply
- Check for plugged outlet hose
- Check for restrictive or collapsed hoses

Should any of these measures fail to get your Viper TX system up and running again or you experience any other problems please contact Air Pumping Engineering Services.

DIMENSIONAL DATA

DIMENSIONS SHOWN ARE FOR GUIDANCE ONLY AND ARE DISPLAYED IN MILIMETRES AND (INCHES)

NOTE : TUBING HAS BEEN REMOVED FOR CLARITY



Alphabetic Key:

A	High Pressure Piston Pump
B	Fast Fill Diaphragm Pump
C	Pressure Gauge
D	Water Fill Point (Ball Cock)
E	Air Inlet ball valve
F	Air Filter / Regulator complete with Autodrain plug
G	Air Lubricator
H	Air Regulator *
I	Air Gauge *
J	Pressure Relief Valve *
K	Air Supply Ball Valve *

Please Note: Parts marked * (G through J) are optional 'extras' and can be fitted if an Air Test Circuit is required.

Numeric Key:

1	Air Supply for A (Ball Valve)
2	Air Supply for B (Ball Valve)
3	Hose, low pressure
4	Hose, high pressure
5	Solvent Cup for B
6	High Pressure Isolation Valve
7	High Pressure Bleed Off Valve
8	Air Regulator for B
9	Suction Leg for B
10	High Pressure Non-Return Valve A to B
11	High Pressure Safety Relief Valve B

Letters and numerals show individual reference points for operation, for step-by-step guide, see page 3